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requires ready familiarity with other parts of the book to make it available.

This kind of treatment may be likened to that used in the Euclidian geometry where a separate demonstration is invented for each proposition and few general methods are employed, a treatment in contrast with the developments of analytical geometry where general laws and methods are applied to successive cases or investigations. This kind of treatment has many advantages from the point of view of the practical man, while its disadvantages are perhaps principally encountered by those who must at some period of their career go somewhat more deeply into theoretical questions.

The contrast between the kinds of treatment I have in mind will be clear to any one who compares Grashof with Church.

2. The diagrams employed by Church were, I think, unique at the time his book was first published, in their combined simplicity and perspicacity. This arose, as I imagine, from the way in which the book came into existence as a transcript of the author's black-board lectures before his classes. Professor Church had the opportunity while yet a young man to devote himself to the single subject of applied mechanics exempt from the distractions which usually beset college teachers of that period of life who commonly have to teach first one and then another subject. He improved that opportunity to prepare this text-book. It was an excellent thing to do, and it was well done. It has stood the test of prolonged use. No important or extensive revision of the work has been undertaken by the author until now, and even now its general character and text has remained unchanged. To make a rough estimate, possibly 100 pages scattered throughout the book have been rewritten and replaced by a new or revised text, leaving the paging unchanged of so much of the original text as is retained. It is needless to say that the emendations and revisions have added greatly to the value of the book by the introduction of much new matter now necessary to the engineer, notably concrete beams, circular ribs and hoops, thick

hollow cylinders and spheres. The most important matters thus added are in the more abstruse parts of the subject, so that for the ordinary student the most important addition consists in the introduction of many valuable illustrative examples, a change which will meet general commendation. Indeed, the book would be improved by the introduction of still further examples. Another change, apparently small, but of real importance, is the adoption of 1.41 for the ratio of the two specific heats of gases instead of $4/3$ used in previous editions, following the example of Weisbach. While $4/3$ may be admissible as a rough average for gases whose molecules consist of three or more atoms, the gases the engineer ordinarily deals with consist so largely of diatomic molecules, especially air, that there is no excuse for using a value differing from the experimental value for air, unless the gas to be treated be known to be some polyatomic fluid, such as superheated steam, carbonic acid, ammonia or the like.

As a whole the book is singular for its clear, lucid treatment, wise selection of subjects and subordination of mathematical to mechanical considerations. It has more definitely in view the needs of the civil engineer than the mechanical or the electrical engineer. Indeed, the devotee of any of these branches of engineering must expect ultimately to specialize to a far greater extent than is possible in a general treatise like this.

HENRY T. EDDY

Allen's Commercial Organic Analysis. Third edition. Vol. II., Part III.

The volume in hand, which completes the treatise, is chiefly devoted to the aromatic substances and to the essential oils, resins, etc. The first part treats of the benzol derivatives included under the following heads: Characters and Classification of Aromatic Acids, Benzoic Acid and Its Derivatives, Cinnamic Acid and Its Derivatives, Salicylic Acid and Its Allies, Dihydroxybenzoic Acids and Their Allies, Gallic Acid and Its Allies, Phthalic Acids. Special attention is paid to salicylic acid, the detection and determination of which

is so important in relation to the pure food law. The various flavoring substances, such as vanillin, saccharin, etc., are treated at length, as are the medicinally important bodies throughout the book. The main portions of the volume, devoted to the essential oils, are, in the opinion of the reviewer, well written and up-to-date. The Extraction of Essential Oils, Classification, General Characters, Analysis, Constituents, Hydrocarbons, Olefinic Terpene Alcohols and Aldehydes, Cyclic Terpene Alcohols, Phenols and Phenolic Ethers, Ketones, Sulphuretted Constituents, Special Characters of Individual Essential Oils and Terpeneless Essential Oils are each discussed in a separate paragraph. The material given is quite full enough for practical purposes and no serious errors were detected. Especially useful are the tables of the important essential oils and of their constituents. Rubber and the resins are thoroughly discussed as follows: Caouchouc and Gutta-percha, Chemical Composition of Resins, General Character of Resins, Resins, Oleo-Resins or Turpentine, Gum-Resins. In general the volume is quite satisfactory.

ALFRED HOFFMAN

Las Plantas Usuales de Costa Rica. By HENRI PITTIER. Washington, H. L. & J. B. McQueen. 1908.

This work on the useful plants of Costa Rica will be welcomed by students of economic botany and tropical agriculture. Professor Pittier has already produced several works relating to tropical agriculture, contributions to the flora of Costa Rica, monographs of certain Central American genera of plants, and treatises on the ethnology and languages of several aboriginal tribes of Central and South America. The present work is illustrated with thirty-one plates, most of which are reproductions of natural size photographs of fruits and plants made by the author. An account of physical features and climate of Costa Rica is given, together with the characteristic plants of the various zones of vegetation, a list of plants grouped according to their uses, the etymology of their common names, derived as they are

from various sources, Nahuatl, or Aztec; the language of the ancient inhabitants of Hayti; various tribes of Central America; and even from the Quichua of the Andes of South America. In addition to these names those of Spanish origin are given. Then follows an alphabetical enumeration of the useful plants of the republic, a tabulated list of the number of species belonging to each plant family thus far known to occur within its limits, and an index to the plants under their botanical names. The work ends with a very complete bibliography of works on tropical agriculture and the botany of Central America. Professor Pittier's present work is the first of its kind dealing with Central America. It was published under the auspices and by the direction of the government of Costa Rica.

W. E. SAFFORD

Human Foods and their Nutritive Value. By HARRY SNYDER. New York, The Macmillan Co. 1908.

At last man is having his share of the results of science applied to animal life. The author clearly states the twentieth century view when he says:

It is believed that a better understanding of the subject of nutrition will suggest ways in which foods may be selected and utilized more intelligently, resulting not only in a pecuniary saving, but also in greater efficiency of physical and mental effort.

This volume will not only supply a need, but will satisfy a real want, a want becoming acutely felt by the laity who are asking for some comprehensible statements as to human foods and their various qualities and relative values. One feels instinctively the master dealing out knowledge at first hand. Here is no compiler sifting more or less ancient and possibly outgrown material.

Not only teachers and students but the business man who has been warned by his physician to take thought for his diet, the club woman who has to "write up a paper" will find sound science as well as useful information about the many kinds of human foods. Such passages as the two quoted below convey economic lessons of great importance.